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## SECTION OF GEOLOGY AND MINERALOGY

### NOVEMBER 2, 1942

PROFESSOR CHESTER R. LONGWELL, Yale University, New Haven, Conn.

*The Dating of Diastrophic Events in Southern Nevada.* (This lecture was illustrated by lantern and kodachrome slides.)

The highly complex geologic structure of southern Nevada reflects several widely separated crustal disturbances. In the Muddy Mountain area the stratigraphic and structural records are more complete than in other parts of the region studied thus far. Paleozoic formations exposed in that area have a total thickness of about 8000 feet. Mesozoic deposits, including at least 2000 feet of Upper Cretaceous strata, are 8000 to 10,000 feet thick. Tertiary basin deposits have a maximum thickness of several thousand feet.

Several disconformities in the older part of the section suggest wide epeirogenic movements; the most conspicuous of these breaks are at the base of the Moenkopi formation (Lower Triassic) and below the distinctive Shinarump conglomerate (Upper Triassic). The earliest large-scale localized movement in the general region is recorded in coarse conglomerate that lies with slight angular unconformity on the Jurassic sandstone. This conglomerate, laid down by streams flowing eastward, is nowhere more than 20 feet thick; it is made up of rounded pebbles and boulders, up to a foot in diameter, derived from all older formations down to and including the Permian. Since the clays and sandstones above the conglomerate yield a flora and fauna of early Upper Cretaceous age, there was strong uplift west of the Muddy Mountains either in Lower Cretaceous or in late Jurassic time.

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The first great orogeny in the immediate region produced gigantic thrust faults and localized intense folding. Horizontal displacement on the Muddy Mountain thrust was at least 15 miles, in a west-east direction; Cambrian limestone overrode Jurassic sandstone. A large thrust at a higher structural level is well displayed in the northern part of the Muddy Mountain area. The thrust plate has been removed by erosion, except for scattered remnants, in an area 20 miles long and 3 miles wide. Formations directly below the thrust lie in great recumbent folds which are broken by steep reverse faults dipping both eastward and westward. Formations in the overturned limb of a recumbent syncline are exposed in several elliptical domes that have been breached by erosion. On the eastern flanks of these domes, the strata have been turned through more than 200° from their original attitudes.

Upper Cretaceous beds are involved in the thrusting in the northern Muddy Mountain area. It is believed that the orogenic movement began in late Cretaceous time, since sediments of that series grow steadily coarser upward in the section. Great fans containing blocks of limestone 10 to 20 feet in diameter extended eastward from the thrust front. Evidently there was subsidence in a large area, since these coarse fan deposits are 3000 to 4000 feet thick. Over-riding of the fan debris by the thrust mass is indicated by a fragment of the thrust plate, nearly half a mile long, embedded in the coarse fan deposits, now tilted and bevelled by erosion.

Several large normal faults came into existence in front of the thrust while the thrusting movement was in progress. Other steep faults formed much later, probably with movements at several dates during the Tertiary and continuing into Recent time. The basin-and-range structure resulting from these faults is superposed on the earlier thrust structure. While the great faults were active, the depressions between the present ranges received interior drainage, under an arid climate. Since the appearance of the Colorado River in the region, much of the basin fill has been removed by the river and its tributaries. As a result the structural relations are exceptionally well displayed in this part of the Basin-and-Range province.

Field work on which these results are based was supported jointly through several seasons by Yale University and the U. S. Geological Survey. The writer gratefully acknowledges also two grants from the Penrose Fund of the Geological Society of America, in 1934 and 1941.

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## SECTION OF BIOLOGY

### NOVEMBER 9, 1942

HENRY C. RAVEN, Department of Comparative Anatomy, The American Museum of Natural History; *Some Morphological Adaptations of Cetaceans (Whales and Porpoises) for Life in the Water.* (This lecture was illustrated by lantern slides and motion pictures.)

Whales are completely adapted for life in the realm of the open sea; so much so that the difference between a typical land mammal and a whale is scarcely less than that between some reptiles and birds.

The origin of the cetaceans is partly shrouded in the rather indistinct palaeontologic record of the early Tertiary Period. Many important specimens representing morphological stages have nevertheless been recovered and these reveal more or less the course followed in the evolution of the modern Cetacea. Many palaeontologists have described the remains of fossil whales. Of the more recent authors, Dr. Remington Kellogg is the most outstanding worker in this field.

The anatomical organization of whales reveals throughout evidence of their having been derived from land mammals. By comparing land mammals and pinnipeds of today with cetaceans, we may get an inkling of some of the first and more superficial changes that took place in the ancestral whales. If we look at the pelage of a polar bear, we see that it is uneven, with short hair on the head, longer hair on the back and the longest hair on the under side of the body. In all the seals, however, which spend much of their time in the water, the hair is short and almost uniform over the whole body; in the cetaceans it is lacking entirely except for rudimentary vibrissae.

The skin itself also shows striking differences. In the bear it is loose and thin, in the seals it is firmer and thicker, and in cetaceans it is perfectly smooth and very thick. Furthermore, in the cetaceans the skin is without the temperature-regulating sudoriferous glands, but there is a very thick layer of fat or blubber in and beneath the skin to insulate the whale against the temperature of the water, which in the sea is usually much lower than that of the animal.

Walmsley (1938, p. 168) in discussing this matter says: "Whales live for the most part in the high seas, seldom passing into shoal water except in difficulties. They migrate each year from Arctic to tropical waters. The temperature of the Arctic waters is 4° C or less, and of the tropical waters, 25° C or more. The body temperature of the whale

has been given as 31.1°, 36.6°, and 36.9° C, that is, a little lower than that of the horse (38.2°) and the sheep (40.2°). As there are no sweat glands in whales, the body temperature must be regulated by the altered activity of the blood vessels of the skin and/or the control of the basal metabolic rate. The blubber, however, it is generally held, is a protection against the cold of the Arctic waters."

Now let us consider some of the aquatic adaptations of the cetacean respiratory tract. First is the position of the nasal opening or blowhole. In modern whales this may be single or double and is near the vertex of the head, not near the front of the mouth. The blowhole is formed by the outgrowth of the sides of the nose beyond the median nasal septum; the nasal septum is present of course in all Cetacea.

In the skulls of some of the Eocene fossil cetaceans the nasal opening was not nearly so far up toward the vertex as in modern whales, though even then its retreat from the tip of the snout was well under way. The mechanism for closing the nostrils was evidently well developed in Eocene whales. A mechanism for excluding water from the respiratory passages during submergence is one of the first requisites of aquatic mammals, as indicated by its presence in such varied animals as the beaver and otter; it is more highly specialized in the pinnipeds. Apparently the deeper these aquatic mammals dive, the tighter their nostrils are closed and the larger and stronger this nasal mechanism becomes.

Dissection has revealed that the mechanism for closing and opening the nostrils or blowhole of whales is composed only of structures common to all mammals. These are: the premaxillary, maxillary and nasal bones, the septal and alar cartilages and the nasal portion of the superficial facial musculature, which is attached to them and innervated by the seventh cranial nerve. In the toothed whales these structures have undergone remarkable changes in size, proportion and function.

The final result, though varying considerably in the different whales and porpoises, has the same function in all. It may be briefly described as follows. Compressor muscles of the nose surround a fibrous fat-filled sac called the melon, or spermaceti organ, the rear end of which is divided into two fibrous projections or plugs covered with smooth black epithelium. When the encompassing compressor muscles contract, exerting pressure on the spermaceti organ, the free projections are forced against the external bony narial apertures, effectually closing them; meanwhile the blowhole at the surface, partly by the action of its compressor muscles and partly by other muscles that arise at the lateral borders of the

base of the rostrum and insert in the skin on each side of the blowhole, is pulled forward and outward (rostro-laterally) at the corners and is thus snapped shut. This arrangement not only affords a powerful means of closing the nose but an equally efficient one for converting it in a fraction of a second into a spacious tubular passage through which used air is quickly expired and fresh air inspired.

While considering the nose and before going on to the remainder of the respiratory tract, it might be well to refer to the olfactory region in whales. In the earliest vertebrates the sense of smell was well developed and continued to function as a distance receptor of odoriferous substances, in contrast to the sense of taste, which functions only on contact. In land-living vertebrates the olfactory apparatus was modified to function only when air passing through the nose came into contact with the moist olfactory end organs. Air passed through the nose not only when it was drawn into or exhaled from the lungs in breathing but also during the act known as "sniffing" or smelling, which consists of short and rapid inhalations and exhalations that allow air to be tested for scent in the nostrils.

When the ancestors of the whales ceased to go to land and spent much of their time submerged, with their nasal passages tightly closed, they had no use for a sense of smell. Further, it is evident from an examination of cetacean skulls that the olfactory parts were reduced and lost even in the fetal stages of odontocetes, and though retained were greatly reduced in the fetal mysticetes.

To proceed with the adaptations of the respiratory tract: some of the palato-pharyngeal muscles have been transformed into an extremely strong sphincter (Huber, 1934, p. 124) that functions to hold the elongated upper portion of the larynx, composed of the epiglottic and supra-arytenoid cartilages, in intimate relation with the internal nares. The spout-like projection of the larynx can be easily held by the sphincter because the upper extremity of the epiglottis has abrupt lateral expansions. These, the laryngeal cartilages and muscles, are described in detail by R. Anthony and F. Coupin (1930) for *Mesoplodon*. This arrangement would preclude the entrance of water into the respiratory tract via the mouth and pharynx.

The trachea is capacious and short, in keeping with the short neck in all Cetacea and the habit of very quick inspiration and expiration.

The diaphragm in Cetacea extends farther forward ventrally and farther backward dorsally than in land mammals, thus not confining the

buoyant air to the forward part of the animal but allowing much of it to be disposed more caudally, so that the lungs occupy the dorsal part of the body cavity except in its most caudal part. This arrangement is doubtless analogous to the disposition of the air bladder in many fishes, which contributes to the balancing effect.

Whales are subjected to great pressure when they make deep dives and the sperm whale is known to go deeper than others. Kellogg (1940, p. 37) records the following incident:

"In April, 1932, the cable repair ship *All America*, while investigating the cause of an interruption in the service of the submarine cable between Balboa, Canal Zone, and Esmeraldas, Ecuador, hoisted to the surface a dead 45-foot Sperm Whale from a depth of 3,240 feet off the coast of Columbia.

"The cable was twisted around the lower jaw of the animal and an additional 180 feet was wrapped around one flipper, the body, and the caudal flukes.

"At such a depth the body of the whale must have been subjected to a pressure of approximately 1,400 pounds per square inch."

The pressure is exerted equally on the whole surface of the animal, and Walmsley (1938, p. 171) states that "The increase of pressure will diminish the volume of air in the lungs and, omitting changes in temperature, 100 volumes at one atmosphere pressure are reduced to 10 volumes at 11 atmospheres pressure; with a decrease in temperature there is a slightly greater reduction. This large decrease in the volume of the contained air must be accompanied by a considerable diminution of the volume of the lungs and this probably explains the large amount of elastic tissue in the thick interalveolar walls of the lungs of whales."

When the lungs are so reduced in volume, there is also a reduction in size of the whole thorax and of all the organs not contained in bony cavities. The abdominal organs are doubtless forced into the thorax to occupy part of the space filled by the lungs before they were compressed.

According to Walmsley, the retia mirabilia are gorged with oxygenated blood which has been forced from the lungs when the animal dives and is under great pressure. Thus the central nervous system is well supplied with blood while the animal is down.

The adaptations of the digestive tract of whales are numerous. In the more generalized of the modern toothed whales the teeth have lost their conspicuous primitive differentiation into incisors, canines, premolars and molars. Here polyisomerism, or de-differentiation has been

at play, resulting in an increased number of uniform, peg-like teeth of no use for chewing but ideally suited for grasping slippery fish, which form the greater part of the diet of most odontocetes. In the large killer whale the teeth are of the same type but much more powerful and are not only used for grasping fish but in tearing the flesh of seals and even large baleen whales.

From the homodont type of dentition mentioned above there are numerous specializations, usually with a marked reduction in the number of teeth. In the white whale (*Delphinapterus*) they are reduced to comparatively few very small teeth in the fore part of the jaws. In the narwhal there are no teeth in the lower jaw and in the upper jaw two maxillary teeth have developed as tusks. In the female these usually grow to a length of eight or ten inches but remain unerupted and embedded in the maxillary bone throughout life. In the male, however, the left one becomes the great straight, spirally-twisted tusk, seven feet or more in length, for which the animal is famous. These tusks and the one or two pairs of mandibular teeth developed in ziphioid whales have become secondary sexual characters and probably are of no use in the prehension of food.

The tongue in odontocetes is long and extends at least to the proximal border of the mandibular symphysis. It is free only at its extremity, if at all.

In the mysticetes, or baleen whales, the food consists of myriads of small pelagic invertebrates and fishes not larger than sardines. This group takes its name from the frayed horny plates of baleen, which are a series of epidermal outgrowths on each side of the palate. The mouth in these forms is enormous. The very long, laterally convex, edentulous mandibular rami are surmounted by flanges of stiff, fibrous connective tissue, which form a wall outside the baleen with its upper border meeting the arched rostrum.

The animal feeds by moving forward with its mouth open. The water passes into the front of the mouth and out at the sides between the numerous baleen plates on which the food collects. When the mouth is closed, the tongue, which may weigh tons, is raised, squeezing out the excess water, after which the food is swallowed.

The fauces in the comparatively small odontocetes is large, so large that the killer whale has been known to swallow seals entire. In the mysticetes, however, the fauces and oesophagus are extremely small, so that only small objects may be swallowed.

The stomach is complex and unlike that of any other mammal. The first compartment, which is the largest, appears to be a dilatation of the oesophagus. It is lined with thick epithelium, which is folded and forms a series of ridges when empty, indicating that it is capable of considerable expansion. The second compartment is the true digestive part which contains the gastric glands. Then follow from one to five more compartments, corresponding to the pyloric portion of the ordinary mammalian stomach. With the exception of the first compartment, all are lined with smooth, soft, glandular mucosa.

The intestinal canal is extremely long and narrow; it is given by Flower (1872, p. 428) for *Tursiops* as fifteen times the length of the animal. In the odontocetes there is no caecum nor any outward distinction between intestine and colon, though the colon may easily be distinguished by its mucosa, which lacks the villi of the intestine.

The mysticetes differ from the odontocetes in having a caecum and the arrangement of the intestine and colon similar to those of land mammals, with ascending, transverse, and descending parts of the colon.

The liver is small and not much divided in whales, and there is no gall bladder.

In the reproductive system there are also many adaptations to life in the water. Chief among these in the male is the streamlining of the body by the incomplete descent of the testes. They descend to the body wall in some cases but there is never any external indication of them. The penis is conical and pointed, with no evident terminal expansion, and may be entirely retracted within a preputial sheath. The only remnant of the pelvis in odontocetes is the ischium, to which the crura of the penis are attached.

In the female the vagina is provided with a series of circular folds (Hein, 1914, p. 63), which during coitus doubtless function to expel or exclude water from this system in conjunction with the conical intromittent organ mentioned above.

At birth the young are very large and precocious. They must be able to swim beside the mother, to come to the surface to breathe and to be suckled under water.

The mammary glands, unlike those of land mammals that form bulges on the ventral contour of the animal, are very much flattened to conform to the general streamlined pattern. Furthermore they contain large milk sinuses. Covering these glands there is the very highly developed paniculus carnosus muscle, which forms a broad sheet an inch

or more thick in a fourteen-foot narwhal. This muscle acts as a compressor of the mammary gland to squirt the milk when the baby grasps the teat with its mouth. The two teats are retracted into grooves except when the young is suckled, an arrangement somewhat analogous to the retractable landing gear of an airplane.

Many aquatic adaptations are present in the locomotor system, most of them in connection with streamlining, such as the complete loss of functional hind limbs, the use of the fore limbs only for balancing, and the exclusive use of the tail for propulsion.

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## SECTION OF ANTHROPOLOGY

NOVEMBER 23, 1942

DOCTOR E. A. HOEBEL, New York University, New York, N. Y.: *Primitive Law and Modern.*

There are moments in field work that brighten the ofttimes unrelieved drudgery of patient dredging for facts—orderly minutia. Field work among American Indians, especially, has long since ceased to be a larking adventure in prospecting. Civilization and acculturation have washed over the Indians too much for that. The gold panning techniques of the past century have given way to a systematic hydraulic dredging, which sifts out the pay dust but only rarely excites the operator by turning up a pure nugget.

Yet, such moments that thrill and excite do occur. And one type of nugget which flashes to light, giving a sustaining lift to the hours of routine work, is the utterance of a pithy epigram from the mouth of an informant or interpreter—an utterance that is refined of the juices and materials which your interrogations have set to work. Your native has seen beyond your queries which at first seemed senseless to him; he has seen beyond the material fact and into the meaning of things; he has caught the purpose of your groping, and because he is not a professor or a social scientist, he has conceived his insight simply, and he forms his inspiration in a quietly uttered reflection that sums up in a single phrase what you must elaborate in a book, or at least a chapter.

One such bit of epigrammatic insight was dropped into my lap by High Forehead, my Cheyenne interpreter. It serves well as a motif quotation for any discussion of primitive law, I think.

In the investigation of Cheyenne law-ways High Forehead had been both intrigued and perplexed by the line of questioning I had been following. "Mr. Grinnell never used to ask questions like those," he commented again and again when we were alone in our rest periods. The questions bothered him because they were for the most part searching inquiries into the ways of conduct in conflict and dispute—rules of conduct embedded in the behavior and attitudes of the Cheyenne people in action in the days before the triumph of White dominance. High Forehead was bothered, because the line of questioning seemed to him to put emphasis on the bad side of Cheyenne behavior. He was bothered, too, because he had his own traditional conception of anthropological interests based on his long experience with Grinnell. Anthropologists ought to

be concerned with the more tangible and showy aspects of culture: particularly, ceremony and ritual, hunt and war parties, food getting, bead working, and stories—not stories about the troubles and squabbles of real people, who must be named, but legends and myths about culture heroes. This is what bothered High Forehead. But gradually he began to perceive that what was done about trouble was more important to our interests than mere misbehavior. The realization slowly obtruded upon his consciousness that the Cheyennes, his people, had on their own responsibility in their time dealt with and met in their own way many problems of social order. And, one noon, as we lay beneath a cottonwood tree, beside a sluggish creek, under a blue Montana sky, he looked at me long, and quietly said, "The Indian on the prairie, before there was the White Man to put him in the guard house, had to have something to keep him from doing wrong."

Yes, the Indian on the prairie had a social order to maintain. And so has every other society of man. Every people has its system of social control, some effective and some less so. And all but a few of the poorest have as a part of their control system a complex of behavior patterns and institutional mechanisms that we may properly treat as law. When this area of behavior we speak of as law is found in the culture of a preliterate people, we call it primitive law. When it is found in the culture of contemporary or recnet literate people, we call it modern.

Tonight we are concerned with Primitive Law and Modern. Implicit in this title is the proposition that there are points of comparability in Primitive Law and Modern. Each is but a part of a common universe of human experience which has grown out of an as yet not completely recognized, and certainly not perfectly understood, set of recurring problems that all societies must face and solve, if they are to exist as successful groups. We recognize a society as a human group acting in accordance with its unique culture. It is an aggregation or population of human beings faced with the fact that it must maintain a successful group order, if it is to continue its social existence. The mechanisms of maintenance are, we know, determined by culture, which defines not only what men shall eat and how they shall eat it but also how they shall conduct themselves in relation to each other. Culture not only provides for nourishment of the body but also provides for the sustenance of society. As a part of the social order, which is a guarantee of perpetuation of the group, we have the legal order, which exists in Law with a capital L.

In speaking of Law with a capital L one infers directly that there are other orthographies of this mighty little three letter word which grows out of trouble, feeds on trouble, and is itself so very troublesome. There is, of course, Law and law, different in capitalization, different in tonality, and—different in content and meaning. And as for law with a small l, it has its own diverse meanings, determinable only from its context, if at all.

It is, we must complain, a lamentable defect of our language that we are lacking in distinctive and effective words for each of the several concepts covered by this one word, law. Our teacher, Professor Boas, has long championed the inventive linguistic capacity of primitives against their deprecators. We are familiar with his sound conclusion that languages in general exhibit about as much versatility as the demands of the culture impose. We know, as he has recently reiterated, "Elaborate distinctions are found that reflect the importance of objects and activities in the lives of the people."[1] Because the condition of snow is important to him, an Eskimo may have a dozen or more distinct words of diverse and ancient root origin to denote snow in delicately differentiated states. But in jurisprudence we do not have accepted words to so much as crudely differentiate the several law aspects of culture. This may be due to the fact that our linguistic technique, in contrast to that of primitives, is so feeble that, as Professor Boas suggests, we have had to take recourse in mere combinations of letters of the alphabet, like FDR, CIO, BMT, to convey complex groups of ideas or attitudes.[2] Or else the distinctions are not important to us, and my discourse tonight is a frivolous waste of time.

I am not capable of passing judgment on the fertility of our linguistic imagination. Nor is the lack of an adequate linguistic formulation of the different aspects of law a suitable test for the matter of linguistic adaptability to cultural needs, for the reason that social scientists, to say nothing of the non-social-science population, are not yet widely awake to the nature and importance of the meaning of law in society. Not unsymptomatic are the Lynds' famous Middletown studies of 1929 and 1937, introduced by Clark Wissler as the first application of the methods of social anthropology to a contemporary American community: a study of "the whole round of its activities."[3] As such

[1] Franz Boas, "Language and Culture," in *Studies in the History of Culture*, Percy Waldon Long, editor, (New York: American Council of Learned Socieites, 1942), page 178.
[2] *Ibid.*, page 178.
[3] Clark Wissler, *Introduction* to Robert S., and Helen M. Lynd's, *Middletown*, (New York: Harcourt Brace and Co., 1929), page v.

it has won wide recognition. And yet, in this social anthropology of an American community Karl Llewellyn has of late wryly observed, "the legal aspects of behavior there did not seem worth canvass—or capable thereof."[4]

Among anthropologists Bronislaw Malinowski was one who bent his efforts toward a correction of this lack. In the last paper prepared for publication before his untimely death, he formulated an important detailed declaration on this very point. His article, "A New Instrument for the Study of Law—Especially Primitive," first published in The Lawyer's Guild Review[5] for May of this year, occasioned such attention and comment in the legal field that The Yale Law Journal sought and obtained permission to republish it as its lead article in June.[6] Here we have a restatement of Malinowski's theory of cultural determinism, the orders of law, and the rôles of law in the societies of man.

It will provide a convenient point of reference for the development of my thesis tonight if we first consider aspects of Malinowski's paper in some detail.

The language difficulty with which we were concerned a few moments ago sets up such an impasse that even the linguistically facile Malinowski was forced to deal with the phenomena of our interest in such artless terms of Law (1), Law (2), Law (3), and Law (4). This gave him a set of handles with which to manipulate the different facets of the complex, but the result is such linguistic drollery as the following: "When we speak of a law-abiding community, we mean Law (3). When we speak that 'law' has been brought into action, we mean Law (4). Law (4) comes into being when Law (3) ceases to work. As long as Law (3) reigns there is no room for Law (4)."[7]

What are the several meanings of these quasi-algebraic expressions?

Law (1) is used as in "law of science." With respect to culture it embraces the rules of imperative determinism imposed by "nature." These are natural laws acted upon by men but not verbalized by them, if they are primitive men. These are the laws which give form to the biologic base toward which Malinowski has insisted all culture must be functionally oriented.

Law (2) is "the rule of conduct standardized in behavior or verbally formulated." It corresponds in general to what is otherwise known as

[4] Karl N. Llewellyn, "The Theory of Legal Science," (The North Carolina Law Review, vol. 20, 1941), note 7a, page 7.
[5] Lawyer's Guild Review, vol. 2, 1942, pages 1-12.
[6] The Yale Law Journal, vol. 51, 1942, pages 1237-1254.
[7] *Op. cit.*, Yale Law Journal, page 1244; Lawyer's Guild Review, page 6.

custom, and also, but not explicitly, to the sociologist's folkways. In his conception of Law (2) Malinowski clung to the idea of "neutral custom," as developed in his Introduction to Hogbin's *Law and Order in Polynesia*.[8] These are supposedly unsanctioned rules of conduct in that Malinowski defined them as involving no clash of interests of individuals or groups. The conduct they call for is taken for granted, and is so socially unimportant that no one is moved to raise a fuss, or hardly an eyebrow, when a deviant deviates from the lines of conduct set out in this category.

Law (3) is said to apply to rules of conduct "which refer to relations between individuals and groups, delimit divergent interests, and curtail disruptive physiological and sociological tendencies. It is the law of order and law maintained."[9] It is the law that is not broken, the law of the law-abiding community. Like Law (2) it exists without any sanctions recognizable by Professor Malinowski. It differs from Law (2) in that its rules are regulative in spheres of conduct where friction results from cross purposes and cross interests. In other words, Law (3) is positively restrictive, and successfully so.

Law (4) is defined as the specific mechanism which is brought into play when a conflict of claims occurs or a rule of social conduct is broken. It is said to be the law of retributive and restitutive social action. It is Law with a capital L.

What these four categories serve to emphasize is: that there is regularity in the social order imposed by nature and maintained by culture; and that this regularity is best seen and treated when broken down into sub-orders of law. And further, any study of these sub-orders of law is sound only when each sub-order is studied as a part of the whole and in its total relation to each and all of the other sub-orders. In other words, culture is an integrated totality, and any part of it must be studied in its complete cultural context. This is the sound functionalism which Malinowski by his works has driven home as a modern anthropological axiom. It is also a precept of the sociological jurisprudes, who are, alas, still a minority in their field: wherefore, it needs again and again to be dinned into the consciousness of men of law. This much of Malinowski's approach is good. But in its detailed orientation I cannot but feel that it is off the track, and leads not to clarity but confusion.

[8] H. Ian Hogbin, *Law and Order in Polynesia: A Study of Primitive Legal Institutions*, (New York: Harcourt Brace and Co., 1934), page xxvi.
[9] Malinowski, "A New Instrument, etc.," Yale Law Journal, page 1250; Lawyer's Guild Review, page 5.

His great difficulty was that he abhorred the concept of sanctions—"the social restraint of violation."[10] He wanted to have his primitive man get along without them, if possible. He preferred to have his custom "neutral." The area of neutral custom in a culture is actually the area of leeway in conventions, that narrow sphere in which the individual has leave to experiment or deviate, to play with innovation. But it is a narrow area, for, after all, conventions are the "right" ways in any culture, and it may be questioned whether any society is indifferent to wrong ways.[11] Between the extremes that exist in the cultural *alternatives*, as defined by Linton,[12] lies what there is of neutral custom. Certainly, the *universals* and *specialties* of culture set standards of expectancy that are more than mere statistical norms of what people do. They are normative standards of what one ought, and even must, do. And being normative, they are sanctioned, if only by the curled lip and the raised eyebrow.

Disliking sanctions, Malinowski limited sanction to Law (4), which he treated as negative law, procedural repression. This, he said, is the legal order. In so doing, he only half perceived the legal order; he saw the action but not the substance. I have in mind what the law professors identify when they speak of adjective law and substantive law. Substantive law consists of the social rules of conduct to be followed by law-abiding men in the give and take of daily life. They are the rules to which adjective law applies so as to channel behavior that men shall go around in certain ways in certain spheres of activity. They define demand-rights and duties, powers and lack of powers, privileges and lack of demand-rights, immunities and liabilities.[13] These substantive rules all fall in the category of Malinowski's Law (3). The legal order, Law with a calital L, therefore quite definitely laps over into Law (3), even though Malinowski claimed it is restricted to Law (4). But not all of his Law (3) is a part of the legal order, as I shall attempt to show later. For the moment, we may say that the body of substantive law consists of social norms, or rules for conduct, which define what a person may and may not do with legal impunity, or conversely, what he must, or must not do, if he would avoid legal penalties. It enunciates the re-

[10] Robert I. MacIver, *Society: Its Structure and Changes*, (New York, Ray Long and Richard Smith, 1931), page 249.
[11] William Graham Sumner, *Folkways; A Study of the Sociological Importance of Usages, Manners, Customs, Mores, and Morals*, (Boston: Ginn and Co., 1913), pages 28 ff.
[12] Ralph M. Linton, *The Study of Man*, (New York: Appleton Century, 1936), pages 271 ff.
[13] For the exact meaning of these terms and their use, see, E. Adamson Hoebel, "Fundamental Legal Concepts As Applied in The Study of Primitive Law," (The Yale Law Journal, vol. 51[1942]), page 954 ff.

quirements of performance and restraint from performance. It consists, therefore, of the norms which are sanctioned by adjective law. It sets the flags in the slalom run of life, if you want a slippery metaphor.

If the substantive law were never broken, there would then be no call for an enforcement machinery. But it is broken betimes, and adjective law embodies the rules of how the dastardly culprit is to be dealt with. It is the procedural law of right modes of action directed against wrong-doers, real and alleged.

The point for which I am reaching is that Professor Malinowski, it seems to me, confused rather than clarified the nature of the legal by limiting it to adjective law solely. It is essential to understand that adjective law is only half of the Law. Adjective law without substantive law is unthinkable. When it does exist, it is only in the abortive tyranny of an Hitlerian Gestapo, which knows no law but its own tortured whimsy.

If Malinowski's Law (3) and Law (4) do not satisfactorily accord with the facts of what constitutes the legal, what alternative concepts may be suggested as more useful?

First, I hope it is clear from my remarks up to this point, that the legal order is to be seen merely as one aspect of the mechanisms of social control. Not all social norms are legal norms. Some of them are non-legal (custom) and others are by-legal. But first, it is probably high time I make clear *what* should pass as legal.

A feature of all social norms, sub-legal and legal, is of course, regularity and expectancy. Norms are what people regularly do and what you count on them doing in the future. Legal norms have regularity, imperative authority, and, in addition, an element of officialdom. A norm, if it is legal, is a must. It is an imperative buttressed by coercive force to be called upon at need. Law has biting teeth, not always bared, but still having the power to rend and destroy, if necessary.

It is essential that we insist upon recognition of the absolute imperative, if we are to make the anthropological treatment of law meaningful and realistic. We must check the anthropological tendency to spread the concept of law over the entire body of social control. To deny that law is limited to the operation of courts of the state is anthropologically sound, but to say that universal custom is law is evidence of muddy thinking. For example, Chapple and Coon's notion that a law is a symbolized "pattern of action for all the members of a group," while custom "is limited to the members of an institution or to part of

an institution,"[14] will get us nowhere in effecting an understanding of what is legal. Similarly vague and overbroad, Driberg has approached the analysis of law in East Africa with the idea that, "Law comprises all those rules of conduct which regulate the behavior of individuals and communities."[15] Gillin in his treatment of Carib law suggested an ephemeral extreme with the declaration that law, broadly considered, is simply that body of opinion within a group which regulates the behavior of the members of the group.[16] It may be happily noted that this custard pie concept of law does not make its way into the recent sociology by the team of Gillin and Gillin.[17]

Against these over-extended anthropological vagaries, consider the legal scientists' expression on the specificity of law. By the English analytical authority, Salmond, rules of law are said to be, "The principles enforced by the State through judicial authorities by physical force in the pursuit of justice whether attained or not."[18] From the great and liberal German, Jhering, we learn that, "Law without force is an empty name."[19] "A legal rule without coercion is a fire which does not burn, a light that does not shine."[20] From the "pure theorist," Kelsen, comes the insistence that law in essence is "an external compulsive order."[21] And from our own great genius of the law, Holmes, "The foundation of jurisdiction is physical power."[22]

We shall err if we do not follow the students of jurisprudence in their analysis of coercive sanction as an important element in law.

In addition, we must reach a clear understanding of the element of officialdom. To the orthodox political theorist, legal philosopher, or lawman the official element in law means a state operating through courts. Here the anthropologist has a justifiable say in demanding that the interpretation of state and courts be wide indeed. It was in response to the demands of anthropological facts that Professor Max Radin was led to observe in reference to the official element in law, "But there is an infallible test for recognizing whether an imagined course of conduct is

[14] Elliot D. Chapple and Carleton S. Coon, *Principles of Anthropology*, (New York: Henry Holt & Co., 1942), page 658.
[15] J. H. Driberg, "Primitive Law in East Africa," (Africa, vol. 1, 1928) page 65.
[16] John Phillip Gillin, "Crime and Punishment among the Barama River Carib of British New Guiana," (American Anthropologist, vol. 36, 1934), page 140.
[17] John Lewis Gillin and John Phillip Gillin, *Sociology*, (New York: The Macmillan Co., 1942). See the discussion on page 539.
[18] John William Salmond, *Jurisprudence*, (London: Sweet & Maxwell, 1924).
[19] Rudolph von Jhering, *Law as a Means to an End*, (New York: The Macmillan Co., translated by Isaac Husick, 1924), page 190.
[20] *Ibid.*, page 241.
[21] Hans Kelsen, "The Pure Theory of Law," (The Law Quarterly Review, vol. 50, 1934), page 48.
[22] Oliver Wendell Holmes, *McDonald v. Mabee*, (United States Reports, vol. 243), page 90; (United States Supreme Court Reporter, vol. 37), page 343.

lawful or unlawful. This infallible test, in our system, is to submit the question to the judgment of a court. In other systems, exactly the same test will be used, but it is often more difficult to recognize the court. None the less, although difficult, it can be done in almost any system at any time."[23] The ambiguous court, difficult to find in some systems, i.e., primitive systems which operate without institutionalized courts manned by a selected personnel of specialists, may be the peoples' court of overtly expressed acceptance or rejection of the claim of a litigant as laid before the bar of public opinion. Remember, in a small primitive community all litigation of claims gathers a crowd of spectators, whose approval or disapproval of the substantive grounds for the claims advanced by each litigant is expressed in one way or another.

In a primitive system of law, the official element means that any thing done or commanded in terms of the Law is done, or commanded, for the well-being of the community. This is wholly true even in systems of so-called private law, or self-help. The aggrieved husband, out to punish the adulterous transgressor of his private marital privilege-rights, if he proceeds in accordance with established and recognized rules, has at least the tacit backing of general social approval. This gives him for the occasion an implicit social authority, and his acts are thereby quasi-official. In a modern law system, in contrast to most primitive ones, only a duly authorized and properly installed state official has the power to exercize the coercive legal imperatives. In our civil law (the field of private wrongs, or torts) the aggrieved party must take the initiative in instituting legal action, but judgment on his claim and the execution of the judgment are reserved for the legal authorities. The provision of judicial and police officials to protect the demand-rights of the private citizen is our token of the public interest in, and recognition of, the aspect of general social well-being in the private claim of the aggrieved.

It is in this sense that the point is made that there is no absolute distinction between private and criminal law in either primitive law or modern.[24] This is not intended to maintain, as Professor Lowie has interpreted the argument, that there is no value in distinguishing crime from tort. We must agree with him that "the crystalized sense of public wrong" and "procedure by an agent of the state" are not minor matters.[25] In fact, the whole sweep of law in its evolution from primitive

[23] Max Radin, "A Restatement of Hohfeld," (Harvard Law Review, vol. 51, 1938), page 1145.
[24] Cf., Karl N. Llewellyn and E. Adamson Hoebel, *The Cheyenne Way: Conflict and Case Law in Primitive Jurisprudence*, (The University of Oklahoma Press, 1941), pages 47–50.
[25] Robert H. Lowie, Review of *The Cheyenne Way*, (American Anthropologist, vol. 44, 1942), pages 478-479.

to modern has been in the direction of the supersedure of private law by public. But primitive law, which consists predominantly of private law, can be understood only by recognizing and insisting on the importance of the fact that the private prosecutor of a tortious transgressor is an implicit public official *pro-tempore, pro eo solo delicto.*

In recapitulation, that which is characteristic of law is: (a) regularity—a common feature of laws of science and all social norms, legal and non-legal; (b) imperative sanctions, law is a "must" with biting teeth; and (c) an element of officialdom—recognized acceptance of the procedure and the prosecutor as operating for good of the society as a whole.

Now what about law-ways? This term is designed to give expression to the whole complex of behavior patterns which go to make up a legal system. It is therefore intended to include not only the laws themselves but also the ways of doing in conjunction with these laws; the ritual of opening a court session, the word formulas of legal lingo, the magical over- and undertones of legal institutions, principles of logic, and the techniques of pleading—all patterns of behavior which provide the connective tissues that give shape to the legal structure. Law-ways are the laws and what people and officials *do* about the law.

Another concept offered for social science use is law-stuff. Not an elegant sounding word, but it has its value. Law-stuff emerges from the matrix of human activity not on the level of law and law-ways but which, by its nature, generates law-ways and law. It is troublesome behavior in the frictional area of clashing interests and dangerous deviations from the norms of the group. It is what Malinowski had in mind when he spoke of Law (3). The lawyer and the legal scholar have not ordinarily concerned themselves with the study of law-stuff, but the anthropologist and sociologist must analyze it carefully. For it is in this area that the sociology of law makes its great and unique contributions. *We* can effectively study law-stuff because our ideal is to see behavior in all its aspects. And since the genesis of law lies in law-stuff, we can contribute greatly to the growth of a more realistic understanding of the nature and social function of law by paying close attention to law-stuff.

There is one other aspect, and a complex one, of Primitive Law and Modern to which I would like to allude before I give expression to my closing thoughts. This is the by-law of sub-groups within the social order. Every established primary and secondary group has its code,

[26] Llewellyn and Hoebel, *op. cit.*, pages 26 *passim.*

consisting of by-laws, applicable to its own members but not to non-members.

The university has its code of fines for late registration and missed examinations, its penalties for dishonorable conduct. The family has its rules for proper conduct at the table, and father (at least some fathers) has authority for enforcement. The clan has its demand-rights against its members for performance of clan duties, and the clan headman or the council has authority for enforcement. The Plains military societies had the power to punish members who failed in their duties to the society. Secret societies of Africa and Melanesia may destroy members who reveal their secrets to the non-initiate. The Church can banish and excommunicate. The demands of by-law can be as pressing as the demands of law. Nevertheless, with due allowance for sporadic exceptions, law prevails over by-law, if it is law in fact. Law speaks for the entire society, while by-law expresses but the interests of a part of the social whole.

This leads us to the lesson which the study of primitive law has to offer for the future. Today we have International By-law but no International Law. On the international level primitive law prevails. And only the most incipient type of primitive law at that! What has passed as international law consists of no more than normative rules for the conduct of affairs between nations as they have been enunciated and agreed upon from time to time by means of treaties, pacts, and covenants. In addition, prevailing custom in international intercourse, recognized by tacit consensus or verbalized in arbitration and world court awards, provides the other main source of its substance. But this body of social norms for international intercourse is as yet no more than the by-laws of the sub-groups we call nations.

International law, so-called, has consisted of substantive rules without imperative legal sanctions. This nation and our people now at war fervently and sincerely believe that we are serving humanity as an enforcer of international law and as a righteous protector of justice and human decency. It is morally right that we should feel so. But our claim to this status would be clearer if the element of world officialdom had been bestowed upon our cause more explicitly by an established world judiciary.

The late League of Nations was created to provide for this need. It gave to international rules the machinery and the personnel of a recognized officialdom. And yet, because the power of universal coercive,

absolute force was withheld from it, it could not make law of the international norms. Under the League international law was a fire which did not burn, a light that failed to shine.

Whatever the idealist may desire, force and the threat of force are the ultimate power in the determination of international behavior, as in law within the nation or tribe. But until force and the threat of force are brought under the socialized control of the world community, by and for the world society, they remain the instruments of social anarchy and not the sanction of world law. That the world has entered the stage of community consciousness in which the people cry out for an organized world law, that there may be world order, is evidenced by the fact that even the Great Disturbers lay the claim before the bar of public opinion that their New Order is to be an order and world regularizer.

We set against their preposterous claim the Four Freedoms as the ideal basis for a true international law. The Four Freedoms offer a goal of deep and immediate emotional appeal, a worthy aim for true men. Yet, as we all know but sometimes forget, the attainment of goals, however worthy, requires the creation and utilization of means. The inevitable instrument we must create, that the Four Freedoms may be realized and maintained, is a true international adjective law. The inescapable corollary of this realization is the creation of a functioning instrument of world decision to speak the law, and the establishment of a supernational armed force that may not be successfully challenged by any nation or minority of nations. It must be a force responsible to the World Commonwealth alone.

To do this we must adjust our psychology to that of world community. Anthropologists do this naturally. We must bend our efforts harder and harder to teach others likewise. Let us drive home the lesson that, "without law there is no order and without community there is no law."

The metamorphosis from primitive law to modern on the plane of international intercourse awaits the emergence of the consciousness of world community by all men. The immediate and unmistakable conclusion from the study of the anthropology of law is that this metamorphosis must and will be turned. The only question is—when? If fulfillment comes in our day, it shall be our happy destiny to participate in the greatest event in legal history.

## NEW MEMBERS

### ELECTED NOVEMBER 19, 1942

### ACTIVE MEMBERS

Lawton, George, Ph.D., Psychology, Director, Bureau of Tests and Measurements, Evander Childs High School, Bronx, New York.

Ross, Sherman, M.A., Psychology, Assistant, The Animal Laboratory, Department of Psychology, Columbia University, New York, N. Y.

### ASSOCIATE MEMBERS

Chandrasekhar, S., Ph.D., Sc.D., Astronomy, Astrophysics, Associate Professor, Theoretical Astrophysics, Yerkes Observatory, Williams Bay, Wisconsin.

Holway, Alfred Harold, Ph.D., Sensory Psychology, Research Associate in Industrial Psychology, Harvard University, Boston, Mass.

Hurvich, L. M., Ph.D., Psychophysiology of Vision, Research Assistant, Laboratory for Psychological Research, Harvard University, Boston, Mass.